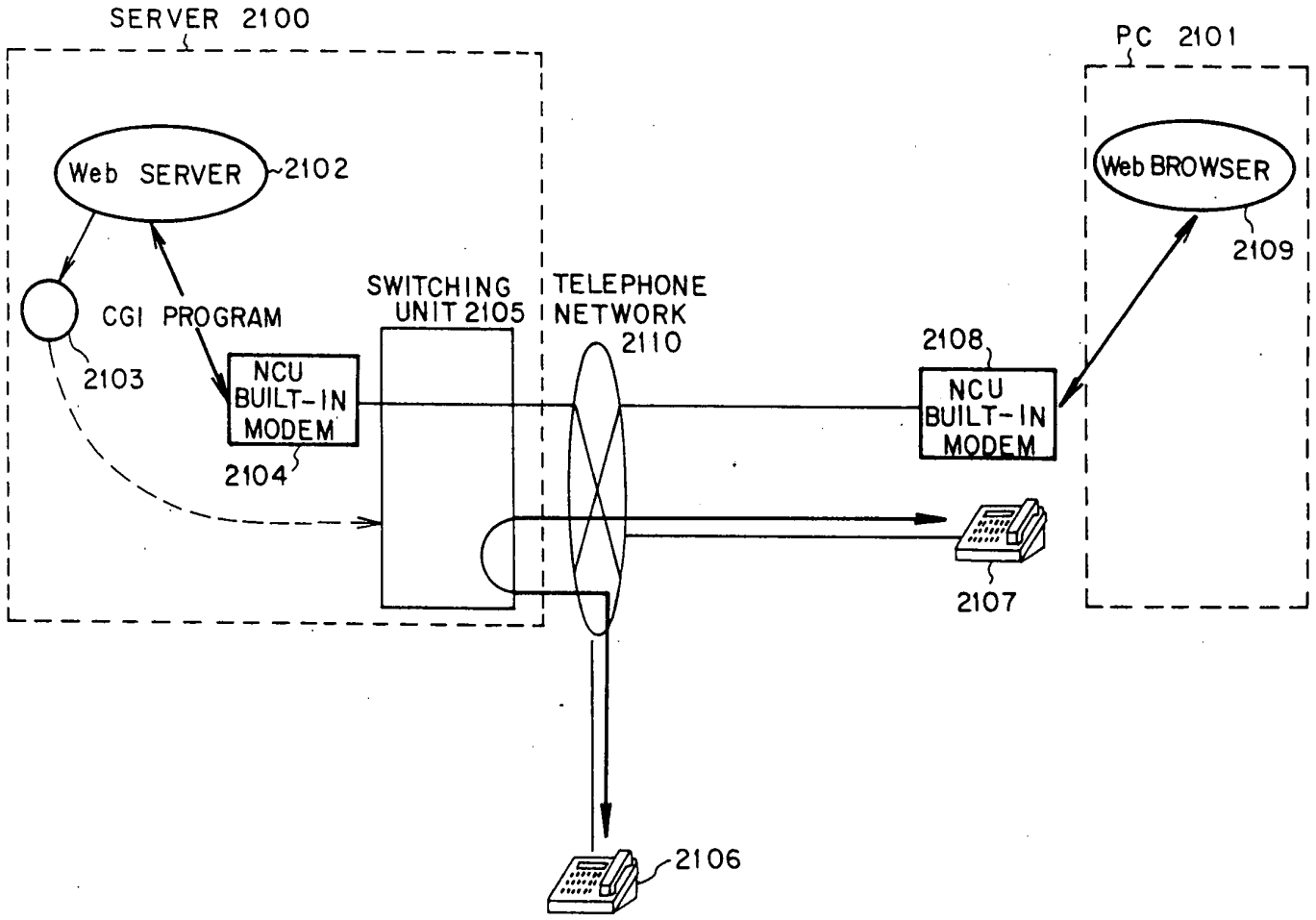


FIG. 1 PRIOR ART

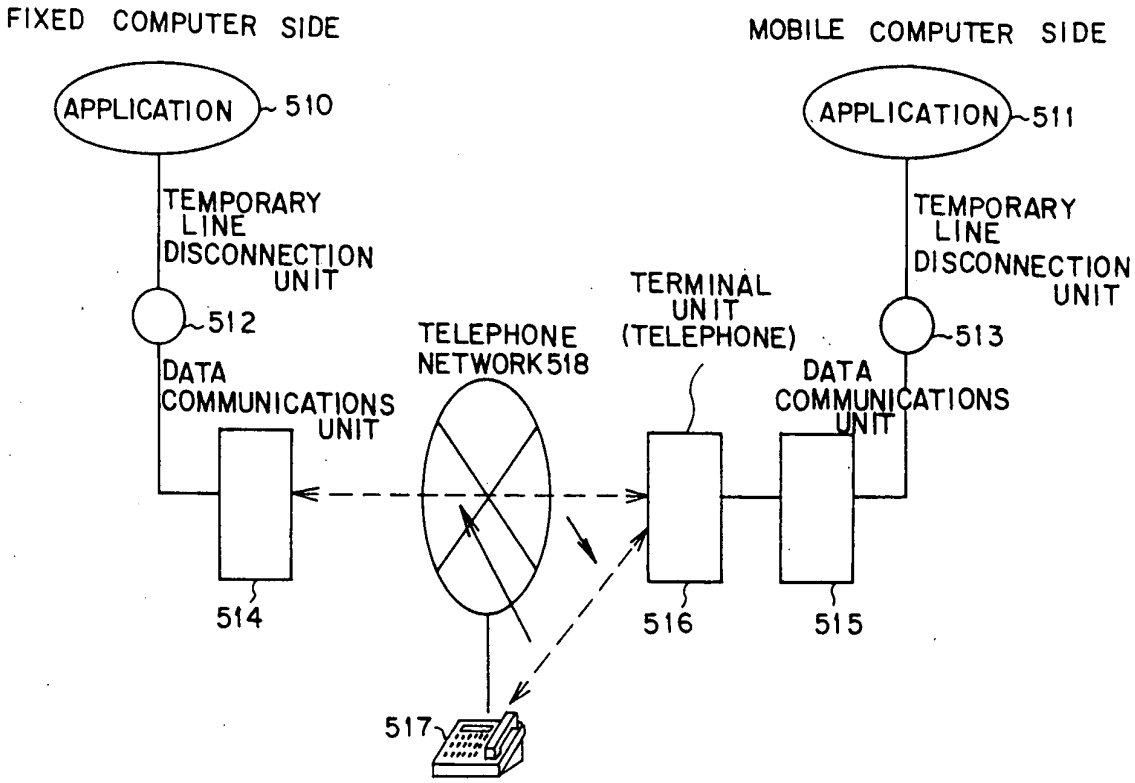

FIXED COMPUTER SIDE
MOBILE COMPUTER SIDE
APPLICATION
510
APPLICATION
511
TEMPORARY LINE DISCONNECTION UNIT
512
TEMPORARY LINE DISCONNECTION UNIT
513
TELEPHONE NETWORK 518
TERMINAL UNIT (TELEPHONE)
DATA COMMUNICATIONS UNIT
DATA COMMUNICATIONS UNIT
514
516
515
517

FIG. 2

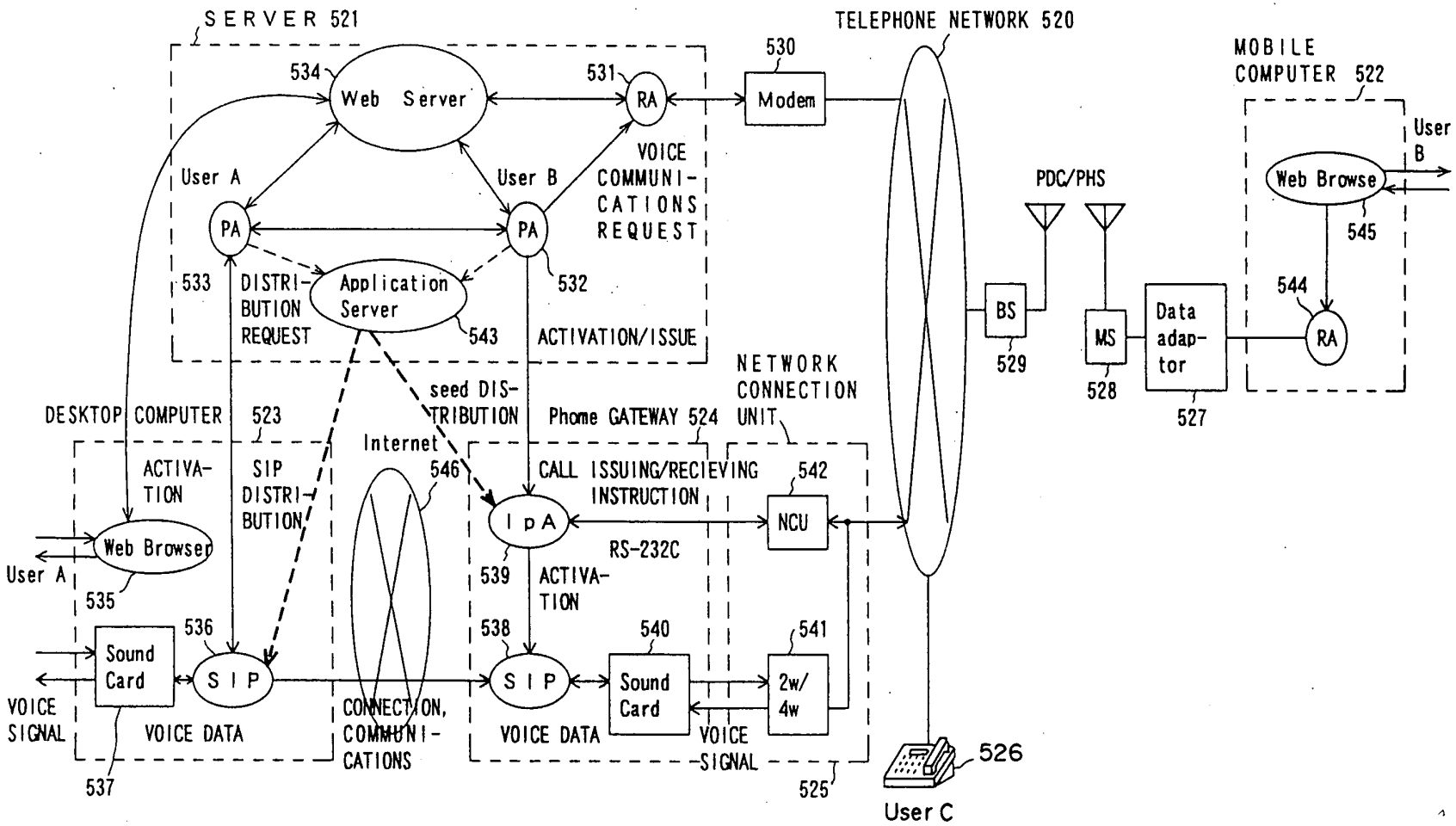

SERVER 521
TELEPHONE NETWORK 520
MOBILE COMPUTER 522
534
Web Server
531
RA
530
Modem
User A
User B
VOICE COMMUNI-CATIONS REQUEST
PA
PA
533
DISTRI-BUTION REQUEST
Application Server
543
532
ACTIVATION/ISSUE
PDC/PHS
BS
529
MS
528
Data adap-tor
527
544
RA
545
Web Browse
User B
NETWORK CONNECTION UNIT
seed DIS-TRIBUTION
DESKTOP COMPUTER
523
Phone GATEWAY 524
Internet
546
ACTIVA-TION
SIP DISTRI-BUTION
CALL ISSUING/RECIEVING INSTRUCTION
542
I p A
NCU
RS-232C
539
ACTIVA-TION
Web Browser
User A
535
536
538
540
541
Sound Card
S I P
S I P
Sound Card
2w/ 4w
VOICE SIGNAL
VOICE DATA
CONNECTION, COMMUNI-CATIONS
VOICE DATA
VOICE SIGNAL
526
User C
537
525

FIG. 3

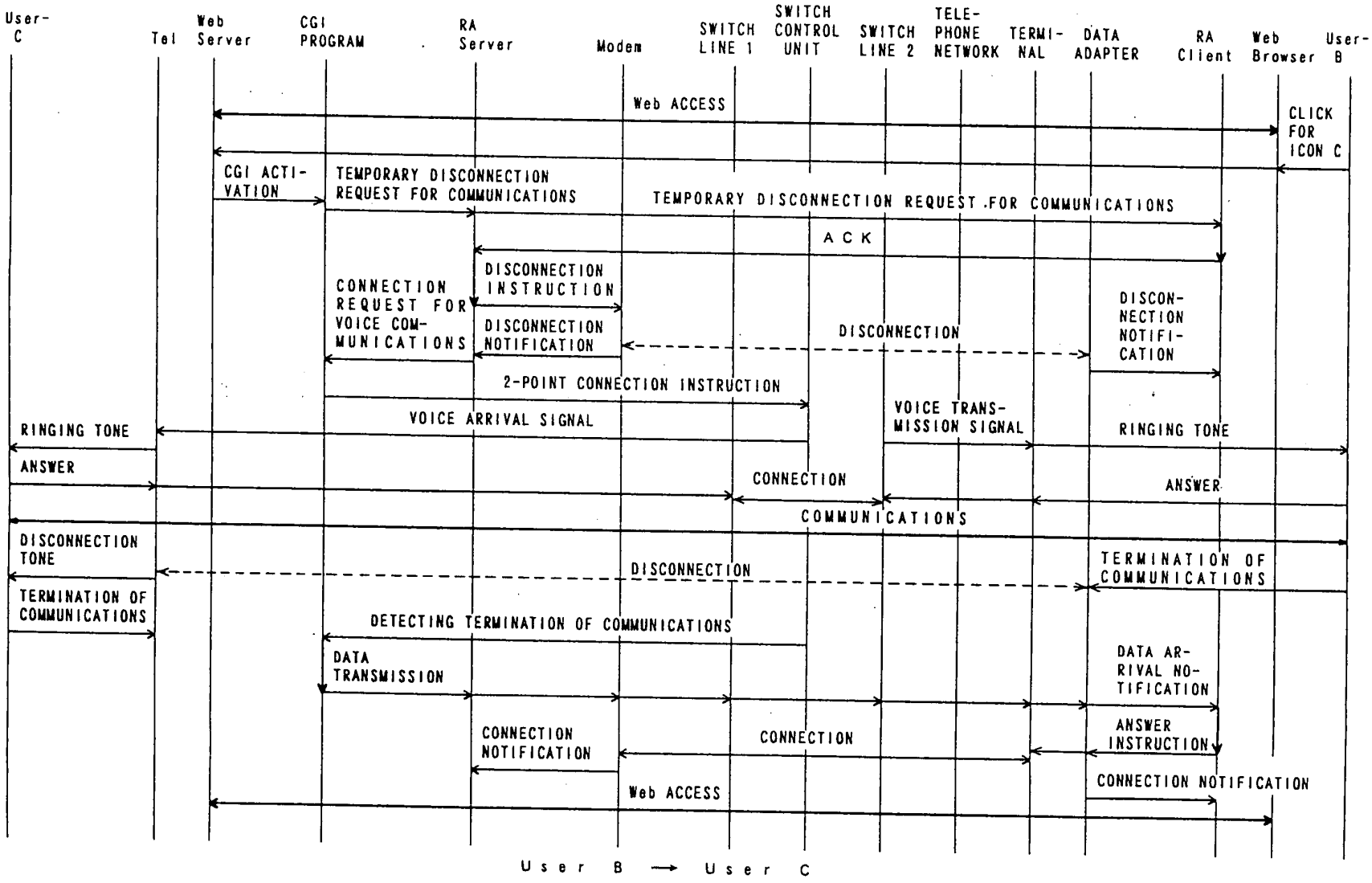

User-C
Tel
Web Server
CGI PROGRAM
RA Server
Modem
SWITCH LINE 1
SWITCH CONTROL UNIT
SWITCH LINE 2
TELE-PHONE NETWORK
TERMI-NAL
DATA ADAPTER
RA Client
Web Browser
User-B
Web ACCESS
CLICK FOR ICON C
CGI ACTI-VATION
TEMPORARY DISCONNECTION REQUEST FOR COMMUNICATIONS
TEMPORARY DISCONNECTION REQUEST FOR COMMUNICATIONS
ACK
DISCONNECTION INSTRUCTION
CONNECTION REQUEST FOR VOICE COM-MUNICATIONS
DISCONNECTION NOTIFICATION
DISCONNECTION
DISCON-NECTION NOTIFI-CATION
2-POINT CONNECTION INSTRUCTION
VOICE ARRIVAL SIGNAL
VOICE TRANS-MISSION SIGNAL
RINGING TONE
RINGING TONE
ANSWER
CONNECTION
ANSWER
COMMUNICATIONS
DISCONNECTION TONE
DISCONNECTION
TERMINATION OF COMMUNICATIONS
TERMINATION OF COMMUNICATIONS
DETECTING TERMINATION OF COMMUNICATIONS
DATA TRANSMISSION
DATA AR-RIVAL NO-TIFICATION
CONNECTION NOTIFICATION
CONNECTION
ANSWER INSTRUCTION
CONNECTION NOTIFICATION
Web ACCESS
User B → User C

FIG. 4

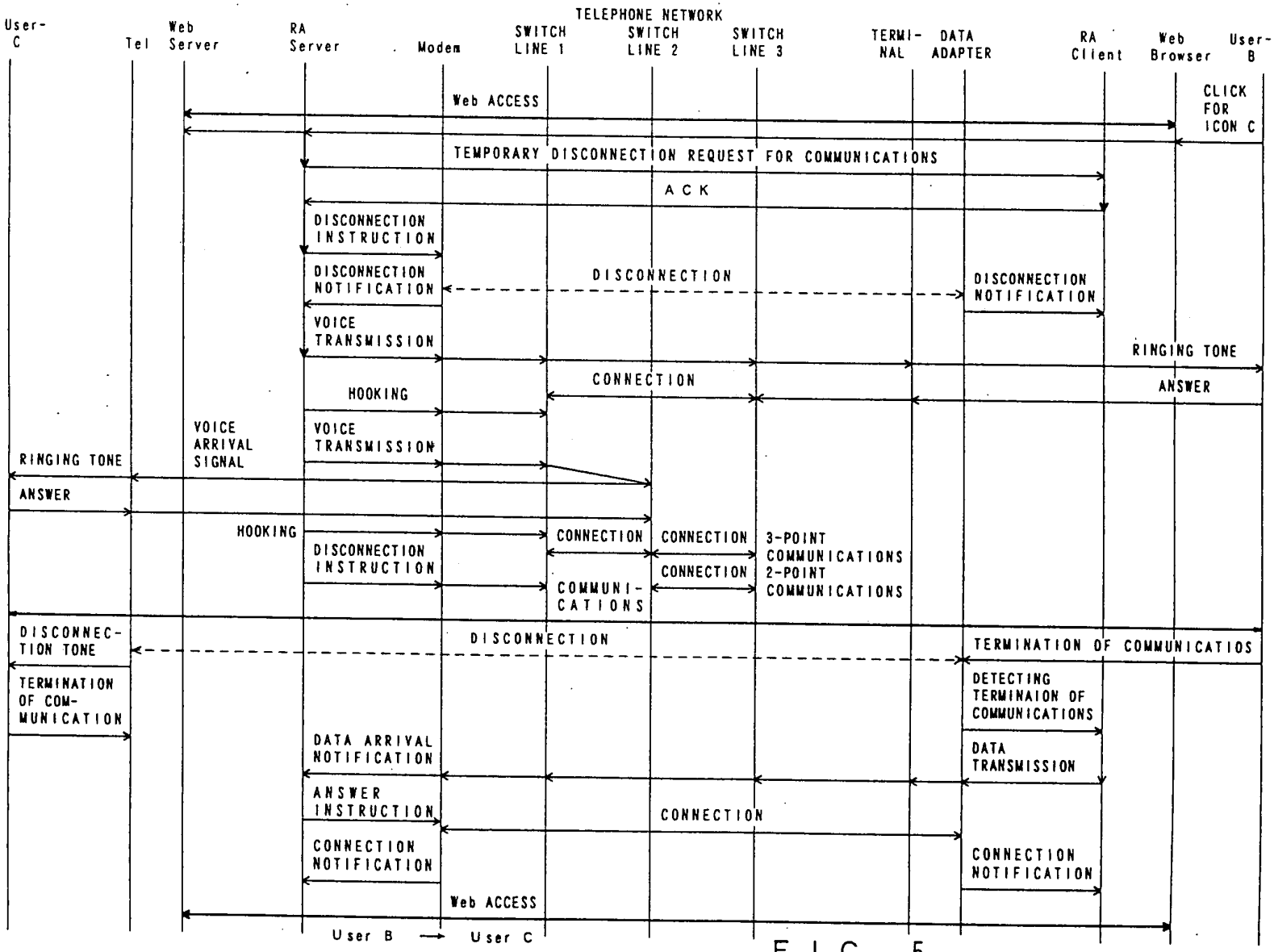

User-C
Tel
Web Server
RA Server
Modem
TELEPHONE NETWORK
SWITCH LINE 1
SWITCH LINE 2
SWITCH LINE 3
TERMI-NAL
DATA ADAPTER
RA Client
Web Browser
User-B
Web ACCESS
CLICK FOR ICON C
TEMPORARY DISCONNECTION REQUEST FOR COMMUNICATIONS
ACK
DISCONNECTION INSTRUCTION
DISCONNECTION NOTIFICATION
DISCONNECTION
DISCONNECTION NOTIFICATION
VOICE TRANSMISSION
RINGING TONE
CONNECTION
ANSWER
HOOKING
VOICE ARRIVAL SIGNAL
VOICE TRANSMISSION
RINGING TONE
ANSWER
HOOKING
CONNECTION
CONNECTION
3-POINT COMMUNICATIONS
DISCONNECTION INSTRUCTION
CONNECTION
2-POINT COMMUNICATIONS
COMMUNI-CATIONS
DISCONNEC-TION TONE
DISCONNECTION
TERMINATION OF COMMUNICATIOS
TERMINATION OF COM-MUNICATION
DETECTING TERMINAION OF COMMUNICATIONS
DATA ARRIVAL NOTIFICATION
DATA TRANSMISSION
ANSWER INSTRUCTION
CONNECTION
CONNECTION NOTIFICATION
CONNECTION NOTIFICATION
Web ACCESS
User B → User C

FIG. 5

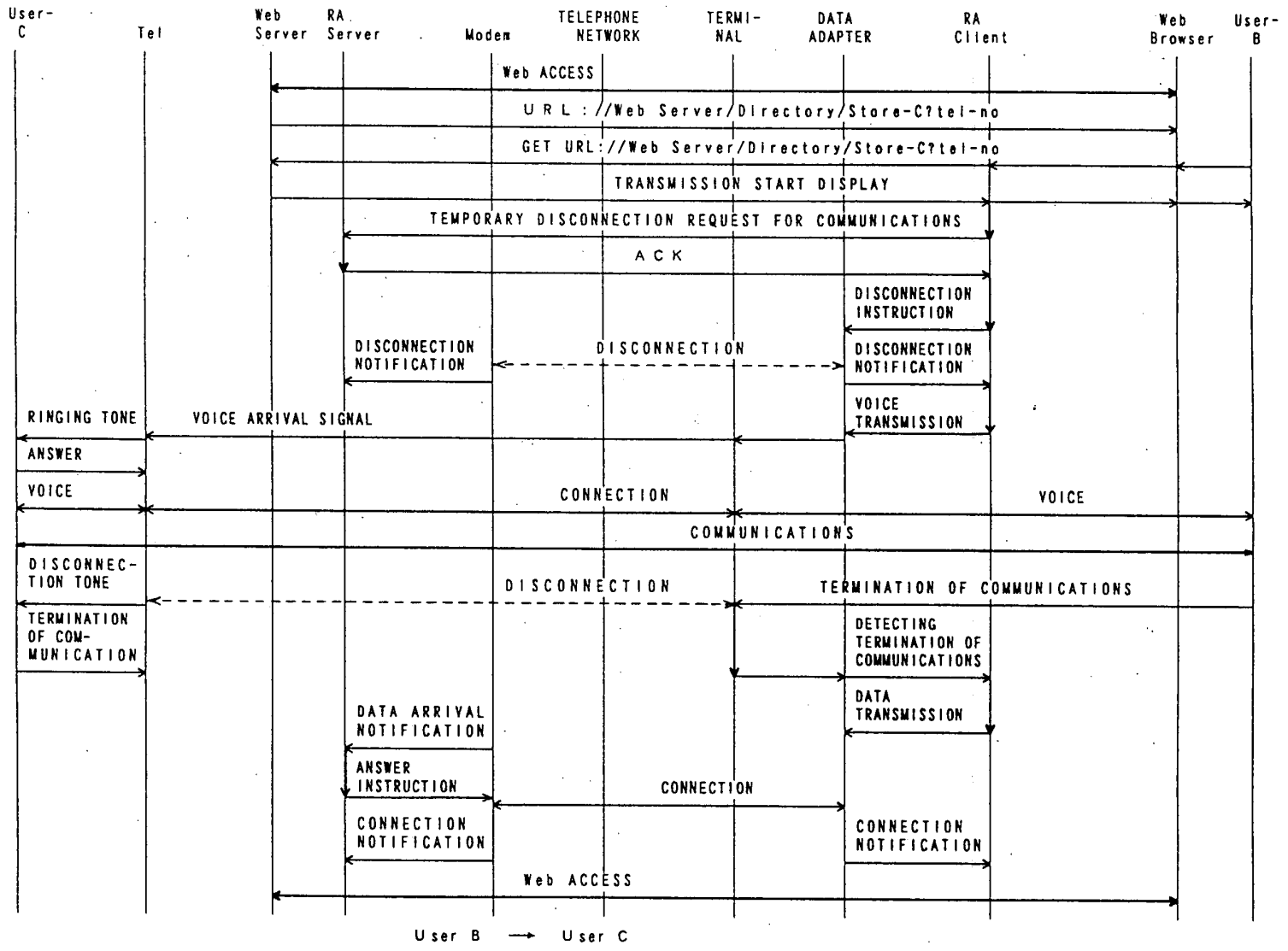

User-C
Tel
Web Server
RA Server
Modem
TELEPHONE NETWORK
TERMI-NAL
DATA ADAPTER
RA Client
Web Browser
User-B
Web ACCESS
URL://Web Server/Directory/Store-C?tel-no
GET URL://Web Server/Directory/Store-C?tel-no
TRANSMISSION START DISPLAY
TEMPORARY DISCONNECTION REQUEST FOR COMMUNICATIONS
ACK
DISCONNECTION INSTRUCTION
DISCONNECTION NOTIFICATION
DISCONNECTION
DISCONNECTION NOTIFICATION
VOICE TRANSMISSION
RINGING TONE
VOICE ARRIVAL SIGNAL
ANSWER
VOICE
CONNECTION
VOICE
COMMUNICATIONS
DISCONNEC-TION TONE
DISCONNECTION
TERMINATION OF COMMUNICATIONS
TERMINATION OF COM-MUNICATION
DETECTING TERMINATION OF COMMUNICATIONS
DATA TRANSMISSION
DATA ARRIVAL NOTIFICATION
ANSWER INSTRUCTION
CONNECTION
CONNECTION NOTIFICATION
CONNECTION NOTIFICATION
Web ACCESS
User B → User C

FIG. 6

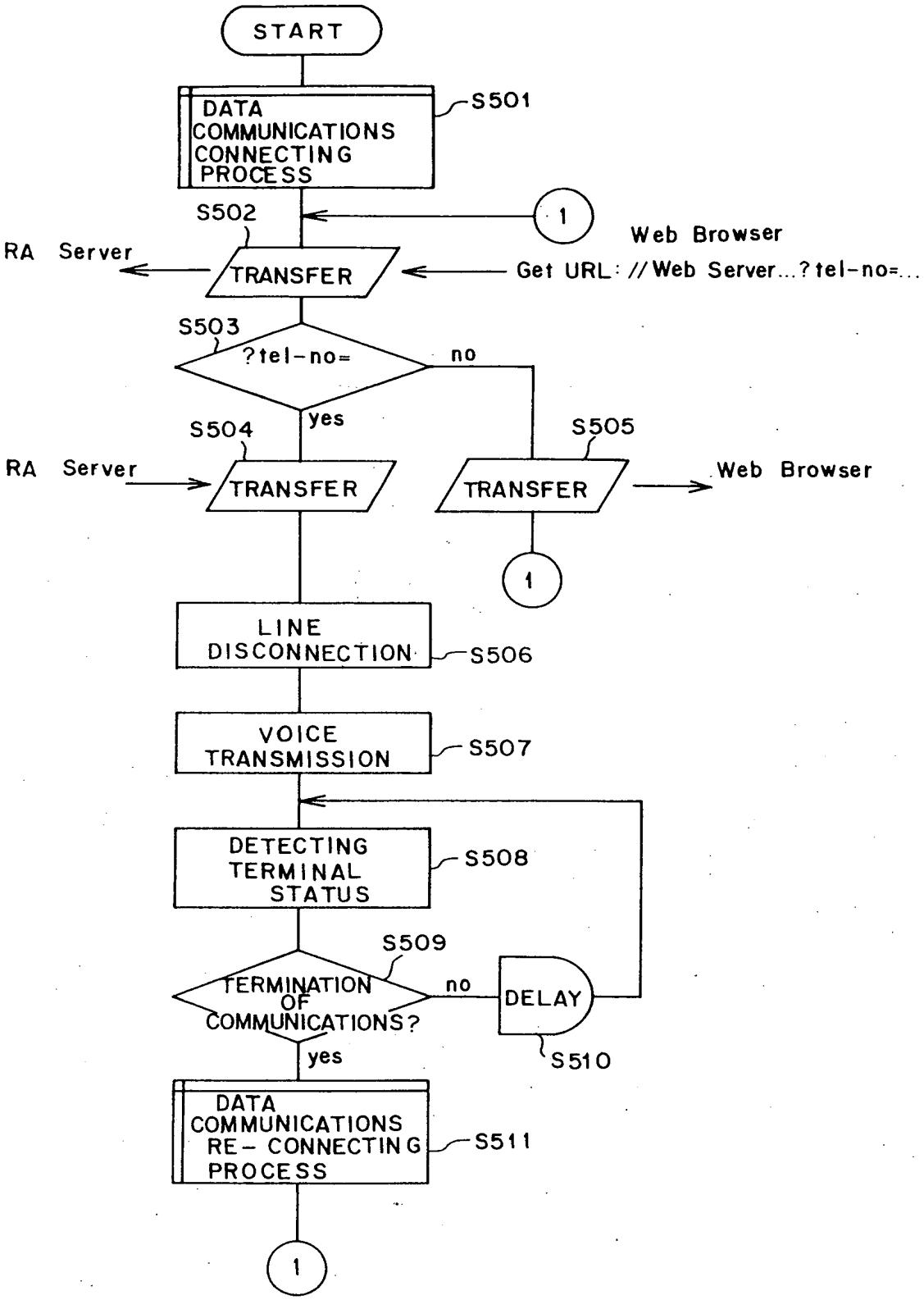

START
DATA COMMUNICATIONS CONNECTING PROCESS
S501
S502
1
Web Browser
RA Server
TRANSFER
Get URL: //Web Server...?tel-no=...
S503
?tel-no=
no
yes
S504
S505
RA Server
TRANSFER
TRANSFER
Web Browser
1
LINE DISCONNECTION
S506
VOICE TRANSMISSION
S507
DETECTING TERMINAL STATUS
S508
S509
TERMINATION OF COMMUNICATIONS?
no
DELAY
S510
yes
DATA COMMUNICATIONS RE-CONNECTING PROCESS
S511
1

FIG. 7

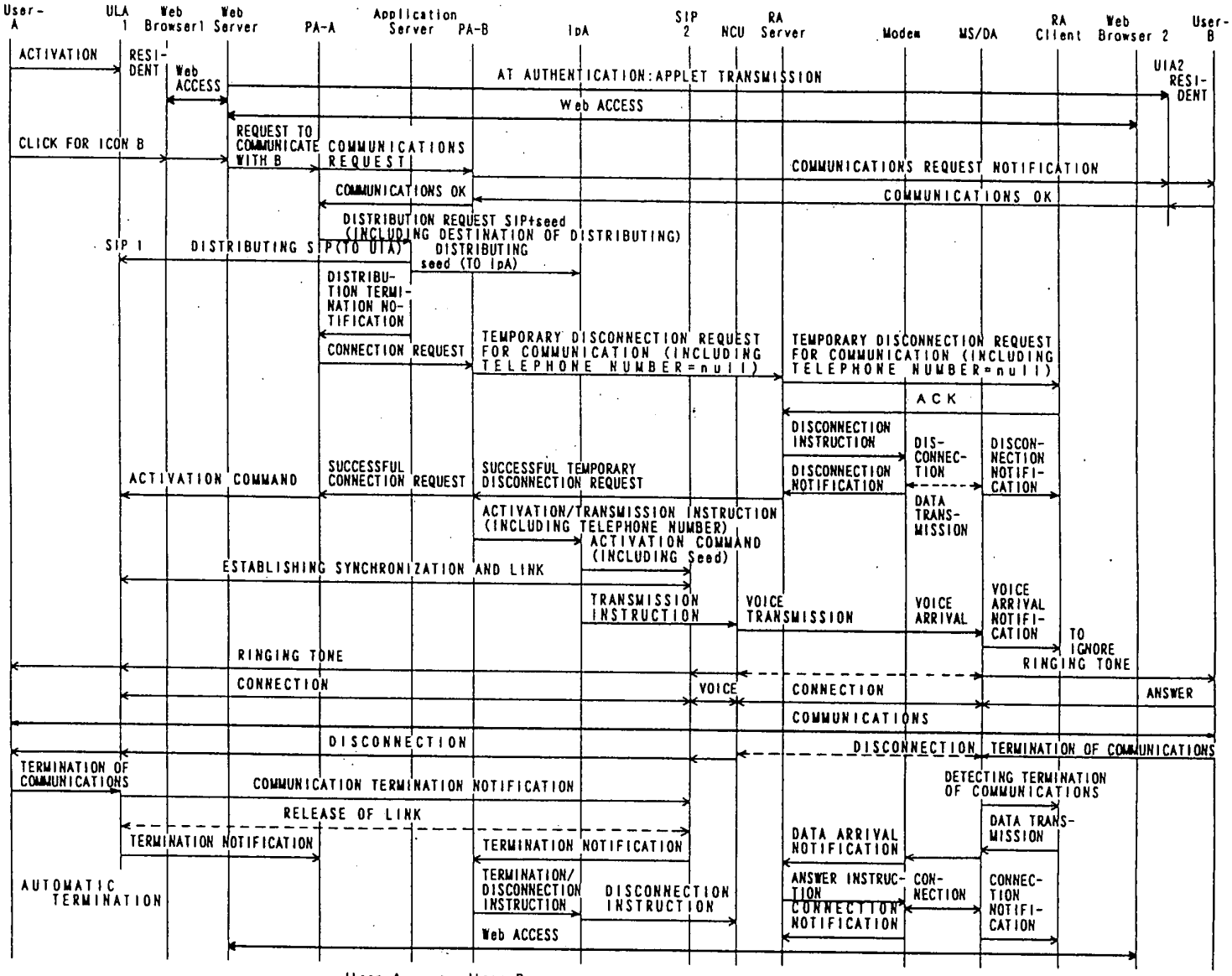

User-A
ULA 1
Web Browser1
Web Server
PA-A
Application Server
PA-B
IpA
SIP 2
NCU
RA Server
Modem
MS/DA
RA Client
Web Browser 2
User-B
ACTIVATION
RESIDENT
Web ACCESS
AT AUTHENTICATION:APPLET TRANSMISSION
UIA2 RESIDENT
Web ACCESS
CLICK FOR ICON B
REQUEST TO COMMUNICATE WITH B
COMMUNICATIONS REQUEST
COMMUNICATIONS REQUEST NOTIFICATION
COMMUNICATIONS OK
COMMUNICATIONS OK
DISTRIBUTION REQUEST SIP+seed (INCLUDING DESTINATION OF DISTRIBUTING)
SIP 1
DISTRIBUTING SIP(TO UIA)
DISTRIBUTING seed (TO IpA)
DISTRIBUTION TERMINATION NOTIFICATION
CONNECTION REQUEST
TEMPORARY DISCONNECTION REQUEST FOR COMMUNICATION (INCLUDING TELEPHONE NUMBER=null)
TEMPORARY DISCONNECTION REQUEST FOR COMMUNICATION (INCLUDING TELEPHONE NUMBER=null)
ACK
DISCONNECTION INSTRUCTION
DISCONNECTION NOTIFICATION
DISCONNECTION
DISCONNECTION NOTIFICATION
ACTIVATION COMMAND
SUCCESSFUL CONNECTION REQUEST
SUCCESSFUL TEMPORARY DISCONNECTION REQUEST
DATA TRANSMISSION
ACTIVATION/TRANSMISSION INSTRUCTION (INCLUDING TELEPHONE NUMBER)
ACTIVATION COMMAND (INCLUDING Seed)
ESTABLISHING SYNCHRONIZATION AND LINK
TRANSMISSION INSTRUCTION
VOICE TRANSMISSION
VOICE ARRIVAL
VOICE ARRIVAL NOTIFICATION
TO IGNORE RINGING TONE
RINGING TONE
CONNECTION
VOICE
CONNECTION
ANSWER
COMMUNICATIONS
DISCONNECTION
DISCONNECTION
TERMINATION OF COMMUNICATIONS
TERMINATION OF COMMUNICATIONS
COMMUNICATION TERMINATION NOTIFICATION
DETECTING TERMINATION OF COMMUNICATIONS
RELEASE OF LINK
DATA TRANSMISSION
TERMINATION NOTIFICATION
TERMINATION NOTIFICATION
DATA ARRIVAL NOTIFICATION
AUTOMATIC TERMINATION
TERMINATION/DISCONNECTION INSTRUCTION
DISCONNECTION INSTRUCTION
ANSWER INSTRUCTION
CONNECTION
CONNECTION NOTIFICATION
CONNECTION NOTIFICATION
Web ACCESS
User A → User B

FIG. 8

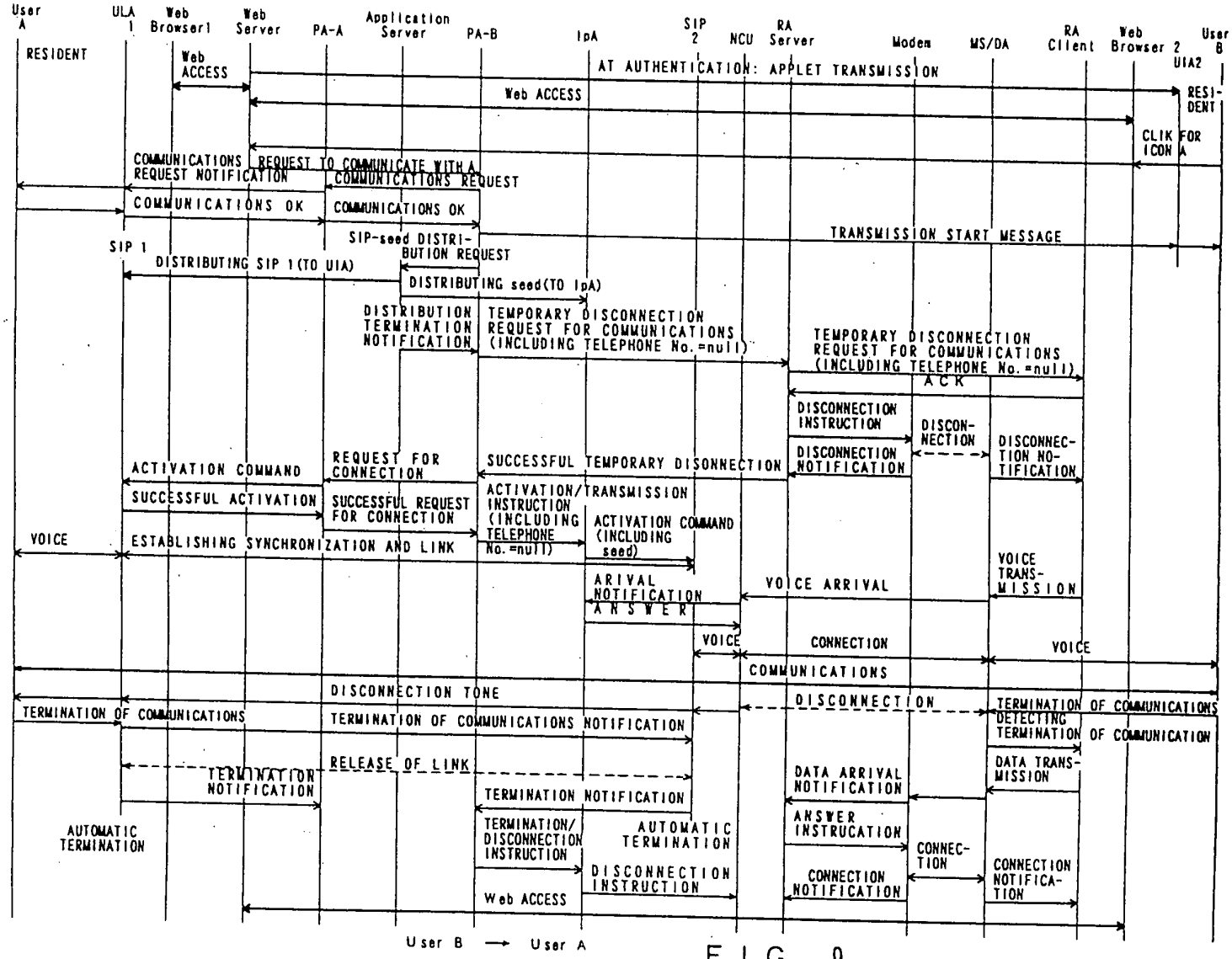

User A
ULA 1
Web Browser1
Web Server
PA-A
Application Server
PA-B
IpA
SIP 2
NCU
RA Server
Modem
MS/DA
RA Client
Web Browser 2
User B
UIA2
RESIDENT
Web ACCESS
AT AUTHENTICATION: APPLET TRANSMISSION
Web ACCESS
RESI-DENT
CLIK FOR ICON A
COMMUNICATIONS REQUEST NOTIFICATION
REQUEST TO COMMUNICATE WITH A
COMMUNICATIONS REQUEST
COMMUNICATIONS OK
COMMUNICATIONS OK
TRANSMISSION START MESSAGE
SIP 1
DISTRIBUTING SIP 1(TO UIA)
SIP-seed DISTRI-BUTION REQUEST
DISTRIBUTING seed(TO IpA)
DISTRIBUTION TERMINATION NOTIFICATION
TEMPORARY DISCONNECTION REQUEST FOR COMMUNICATIONS (INCLUDING TELEPHONE No.=null)
TEMPORARY DISCONNECTION REQUEST FOR COMMUNICATIONS (INCLUDING TELEPHONE No.=null)
ACK
DISCONNECTION INSTRUCTION
DISCON-NECTION
DISCONNECTION NOTIFICATION
DISCONNEC-TION NO-TIFICATION
ACTIVATION COMMAND
REQUEST FOR CONNECTION
SUCCESSFUL TEMPORARY DISONNECTION
SUCCESSFUL ACTIVATION
SUCCESSFUL REQUEST FOR CONNECTION
ACTIVATION/ TRANSMISSION INSTRUCTION (INCLUDING TELEPHONE No.=null)
ACTIVATION COMMAND (INCLUDING seed)
VOICE
ESTABLISHING SYNCHRONIZATION AND LINK
VOICE TRANS-MISSION
ARIVAL NOTIFICATION
VOICE ARRIVAL
ANSWER
VOICE
CONNECTION
VOICE
COMMUNICATIONS
DISCONNECTION TONE
DISCONNECTION
TERMINATION OF COMMUNICATIONS
TERMINATION OF COMMUNICATIONS
TERMINATION OF COMMUNICATIONS NOTIFICATION
DETECTING TERMINATION OF COMMUNICATION
RELEASE OF LINK
TERMINATION NOTIFICATION
DATA ARRIVAL NOTIFICATION
DATA TRANS-MISSION
TERMINATION NOTIFICATION
AUTOMATIC TERMINATION
TERMINATION/ DISCONNECTION INSTRUCTION
AUTOMATIC TERMINATION
ANSWER INSTRUCATION
CONNEC-TION
DISCONNECTION INSTRUCTION
CONNECTION NOTIFICATION
CONNECTION NOTIFICA-TION
Web ACCESS
User B → User A

FIG. 9

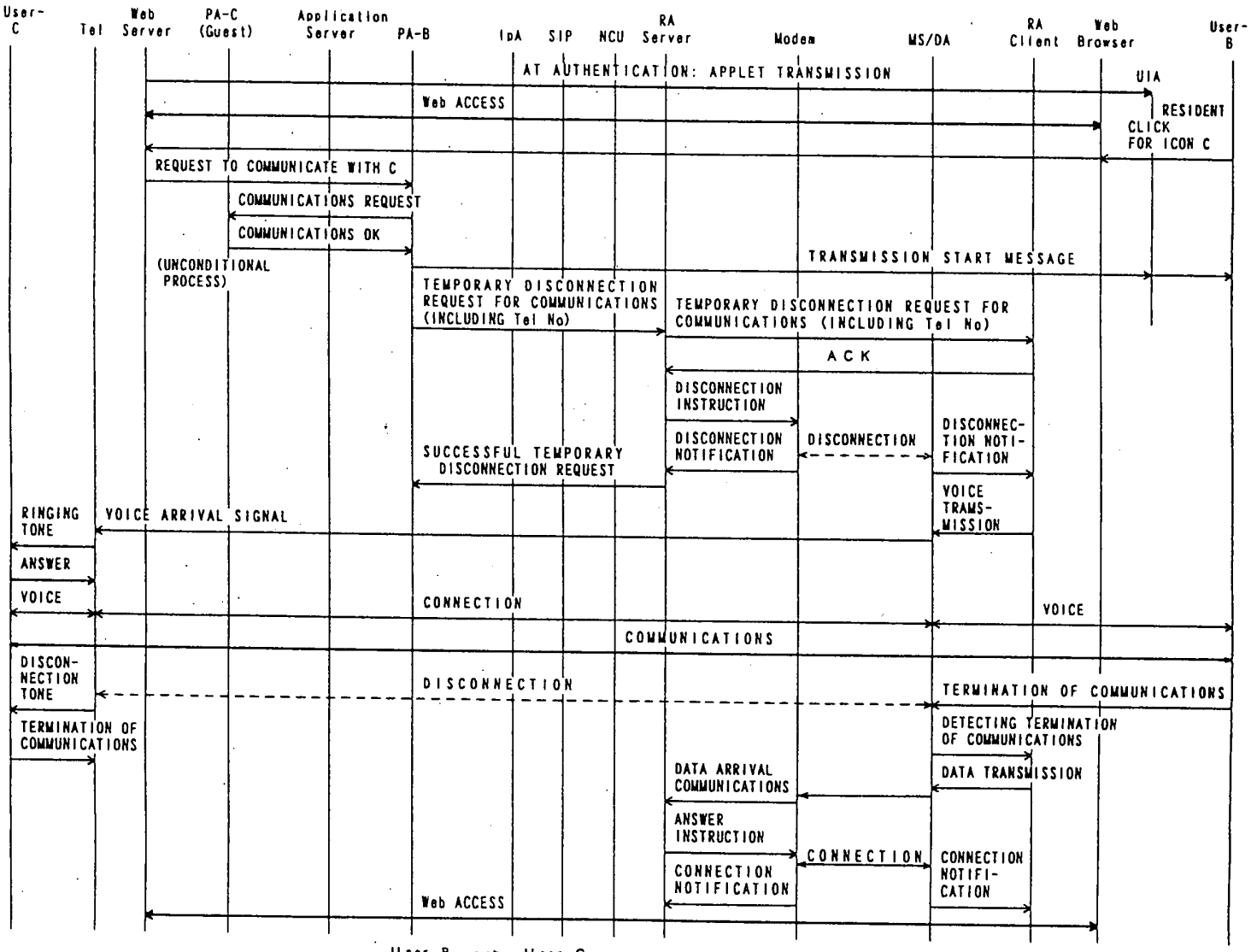
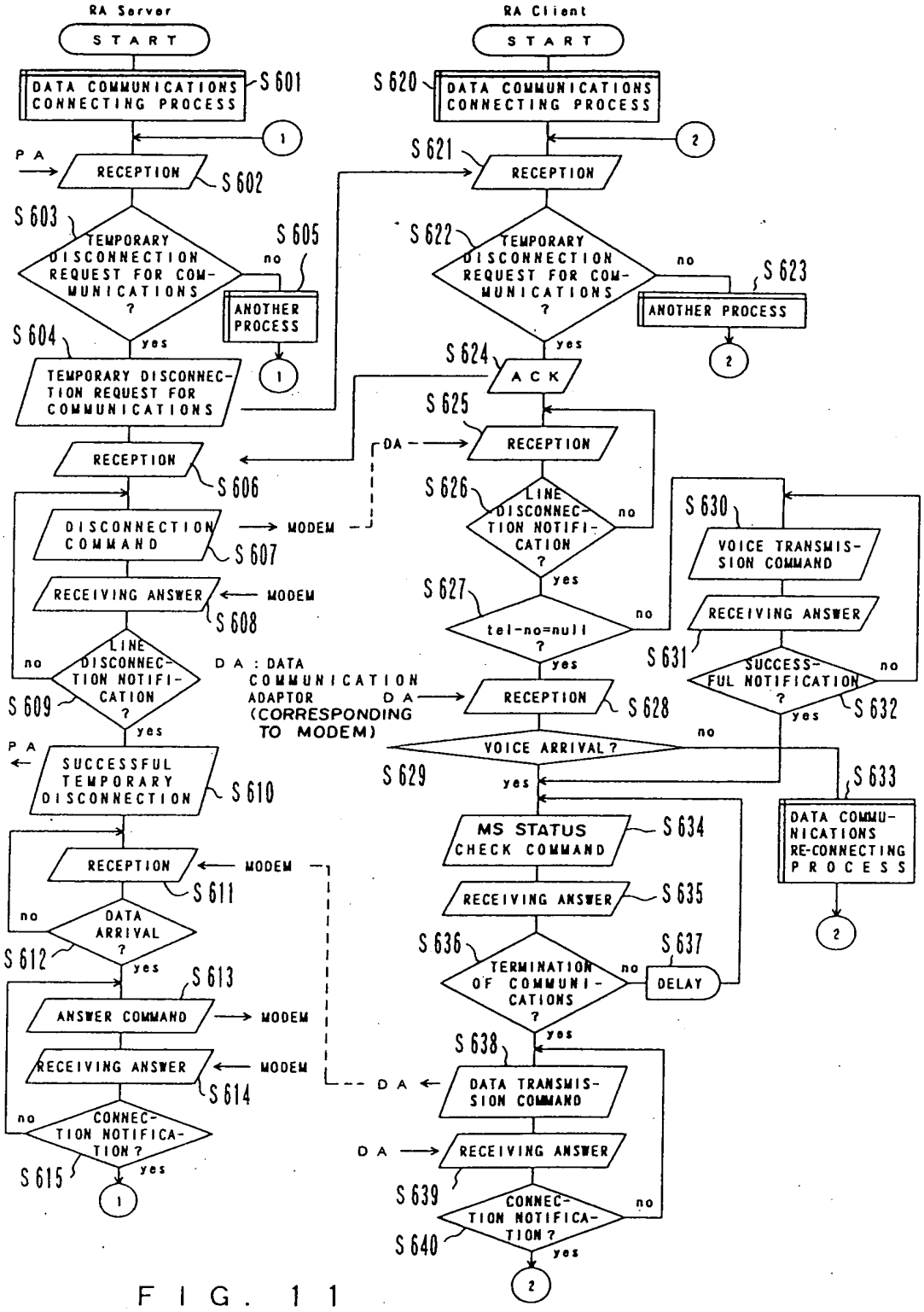

User-C
Tel
Web Server
PA-C (Guest)
Application Server
PA-B
IpA
SIP
NCU
RA Server
Modem
MS/DA
RA Client
Web Browser
User-B
AT AUTHENTICATION: APPLET TRANSMISSION
UIA
Web ACCESS
RESIDENT CLICK FOR ICON C
REQUEST TO COMMUNICATE WITH C
COMMUNICATIONS REQUEST
COMMUNICATIONS OK
(UNCONDITIONAL PROCESS)
TRANSMISSION START MESSAGE
TEMPORARY DISCONNECTION REQUEST FOR COMMUNICATIONS (INCLUDING Tel No)
TEMPORARY DISCONNECTION REQUEST FOR COMMUNICATIONS (INCLUDING Tel No)
ACK
DISCONNECTION INSTRUCTION
DISCONNECTION NOTIFICATION
DISCONNECTION
DISCONNECTION NOTIFICATION
SUCCESSFUL TEMPORARY DISCONNECTION REQUEST
VOICE TRANSMISSION
RINGING TONE
VOICE ARRIVAL SIGNAL
ANSWER
VOICE
CONNECTION
VOICE
COMMUNICATIONS
DISCONNECTION TONE
DISCONNECTION
TERMINATION OF COMMUNICATIONS
TERMINATION OF COMMUNICATIONS
DETECTING TERMINATION OF COMMUNICATIONS
DATA ARRIVAL COMMUNICATIONS
DATA TRANSMISSION
ANSWER INSTRUCTION
CONNECTION
CONNECTION NOTIFICATION
CONNECTION NOTIFICATION
Web ACCESS
User B → User C

FIG. 10


RA Server
START
DATA COMMUNICATIONS CONNECTING PROCESS
S 601
PA
RECEPTION
S 602
S 603
TEMPORARY DISCONNECTION REQUEST FOR COMMUNICATIONS ?
no
S 605
ANOTHER PROCESS
yes
S 604
TEMPORARY DISCONNECTION REQUEST FOR COMMUNICATIONS
RECEPTION
S 606
DISCONNECTION COMMAND
MODEM
S 607
RECEIVING ANSWER
MODEM
S 608
no
LINE DISCONNECTION NOTIFICATION ?
S 609
yes
PA
SUCCESSFUL TEMPORARY DISCONNECTION
S 610
RECEPTION
MODEM
S 611
no
DATA ARRIVAL ?
S 612
yes
S 613
ANSWER COMMAND
MODEM
RECEIVING ANSWER
MODEM
S 614
no
CONNECTION NOTIFICATION ?
S 615
yes
1
RA Client
START
S 620
DATA COMMUNICATIONS CONNECTING PROCESS
2
S 621
RECEPTION
S 622
TEMPORARY DISCONNECTION REQUEST FOR COMMUNICATIONS ?
no
S 623
ANOTHER PROCESS
2
yes
S 624
ACK
S 625
RECEPTION
DA
S 626
LINE DISCONNECTION NOTIFICATION ?
no
yes
S 627
tel-no=null ?
no
yes
RECEPTION
S 628
VOICE ARRIVAL ?
no
S 629
yes
S 630
VOICE TRANSMISSION COMMAND
RECEIVING ANSWER
S 631
SUCCESSFUL NOTIFICATION ?
no
yes
S 632
S 633
DATA COMMUNICATIONS RE-CONNECTING PROCESS
2
MS STATUS CHECK COMMAND
S 634
RECEIVING ANSWER
S 635
S 636
TERMINATION OF COMMUNICATIONS ?
no
S 637
DELAY
yes
S 638
DATA TRANSMISSION COMMAND
DA
RECEIVING ANSWER
DA
S 639
CONNECTION NOTIFICATION ?
no
S 640
yes
2
D A : DATA COMMUNICATION ADAPTOR (CORRESPONDING TO MODEM)

F I G. 1 1

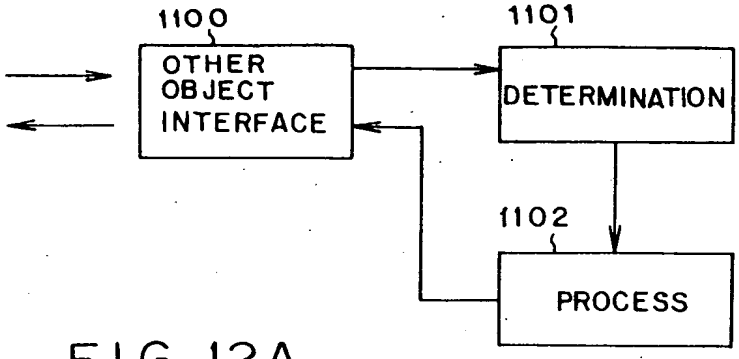


FIG. 12A

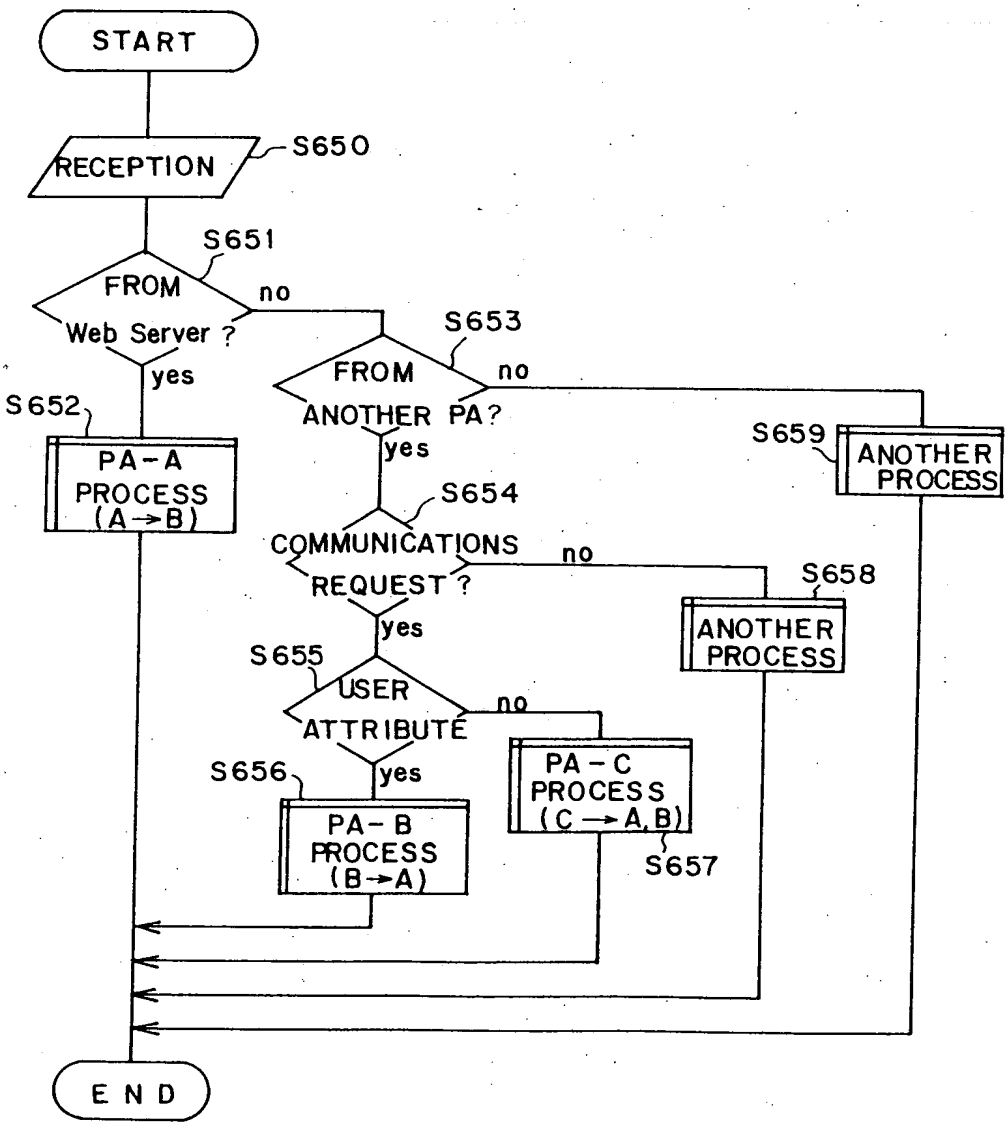


FIG. 12B

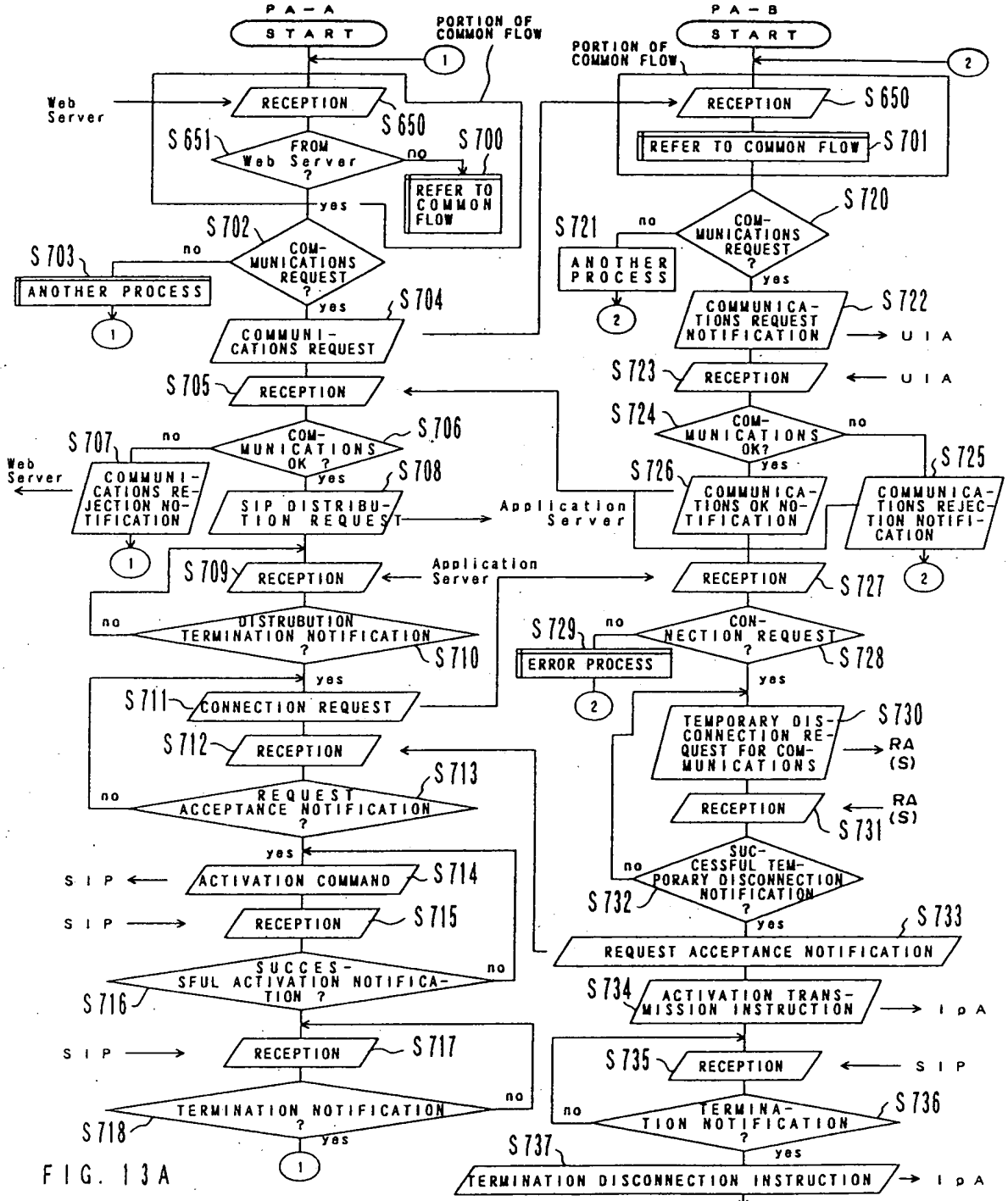


FIG. 13A

FIG. 13B

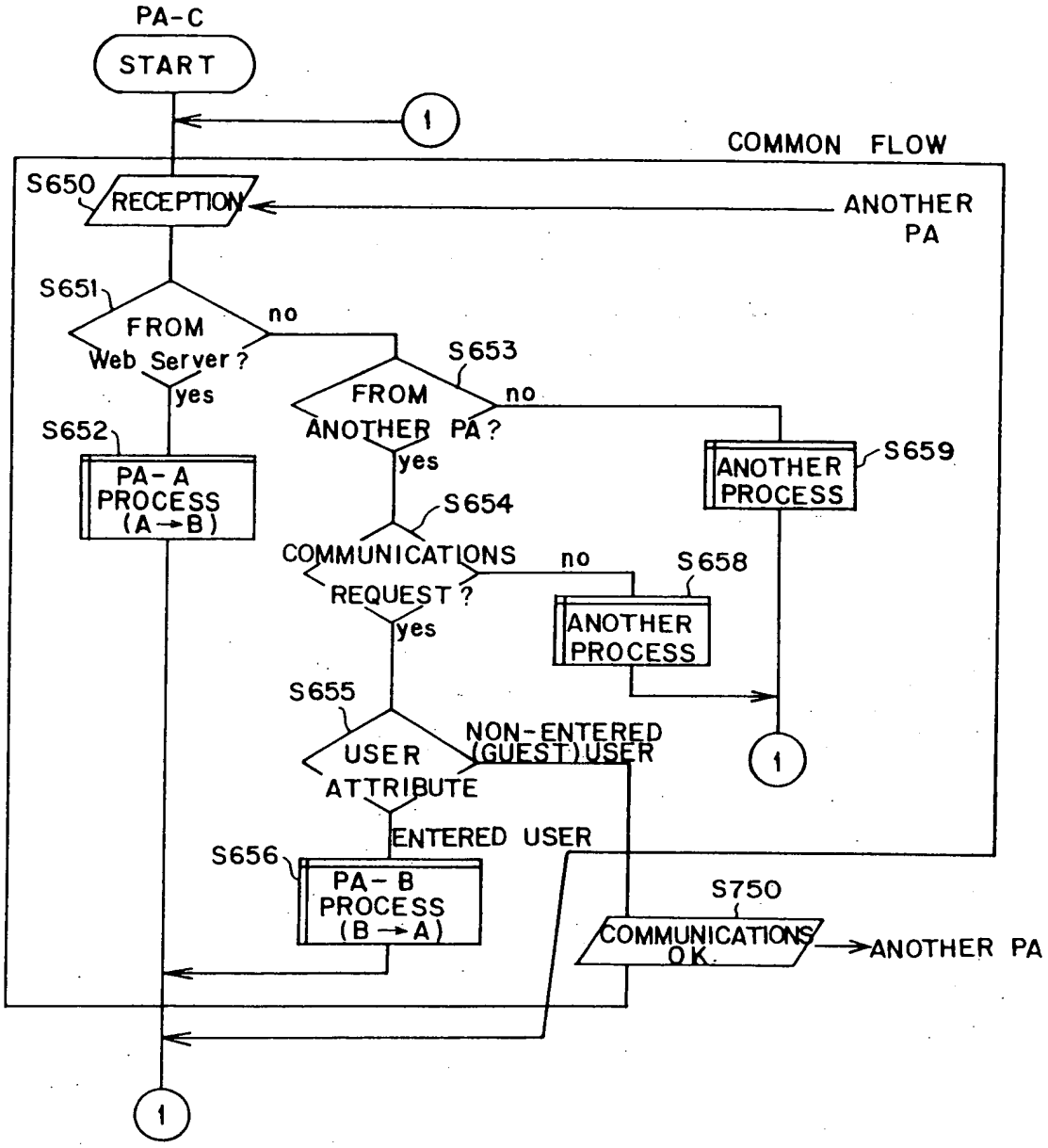

PA-C
START
1
COMMON FLOW
S650
RECEPTION
ANOTHER PA
S651
FROM Web Server ?
no
yes
S653
FROM ANOTHER PA ?
no
yes
S652
PA-A PROCESS (A→B)
S659
ANOTHER PROCESS
S654
COMMUNICATIONS REQUEST ?
no
yes
S658
ANOTHER PROCESS
S655
USER ATTRIBUTE
NON-ENTERED (GUEST) USER
ENTERED USER
1
S656
PA-B PROCESS (B→A)
S750
COMMUNICATIONS O.K.
ANOTHER PA
1

FIG. 14

EP 0 806 680 A2

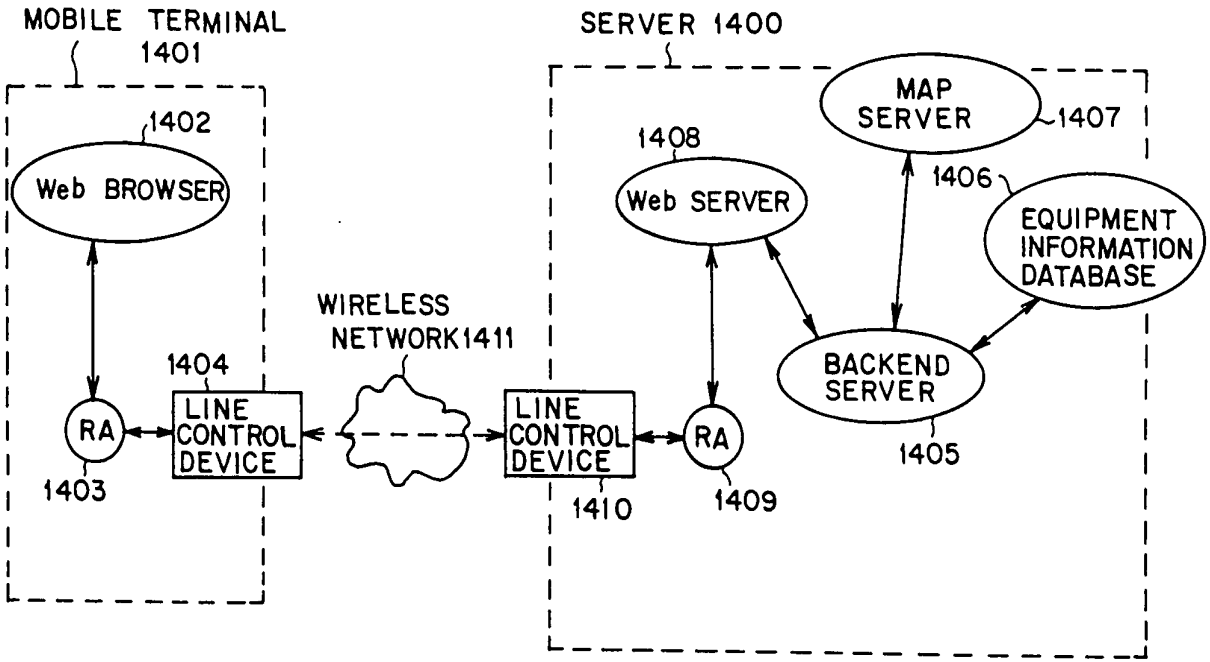


FIG. 15

JP 3066680

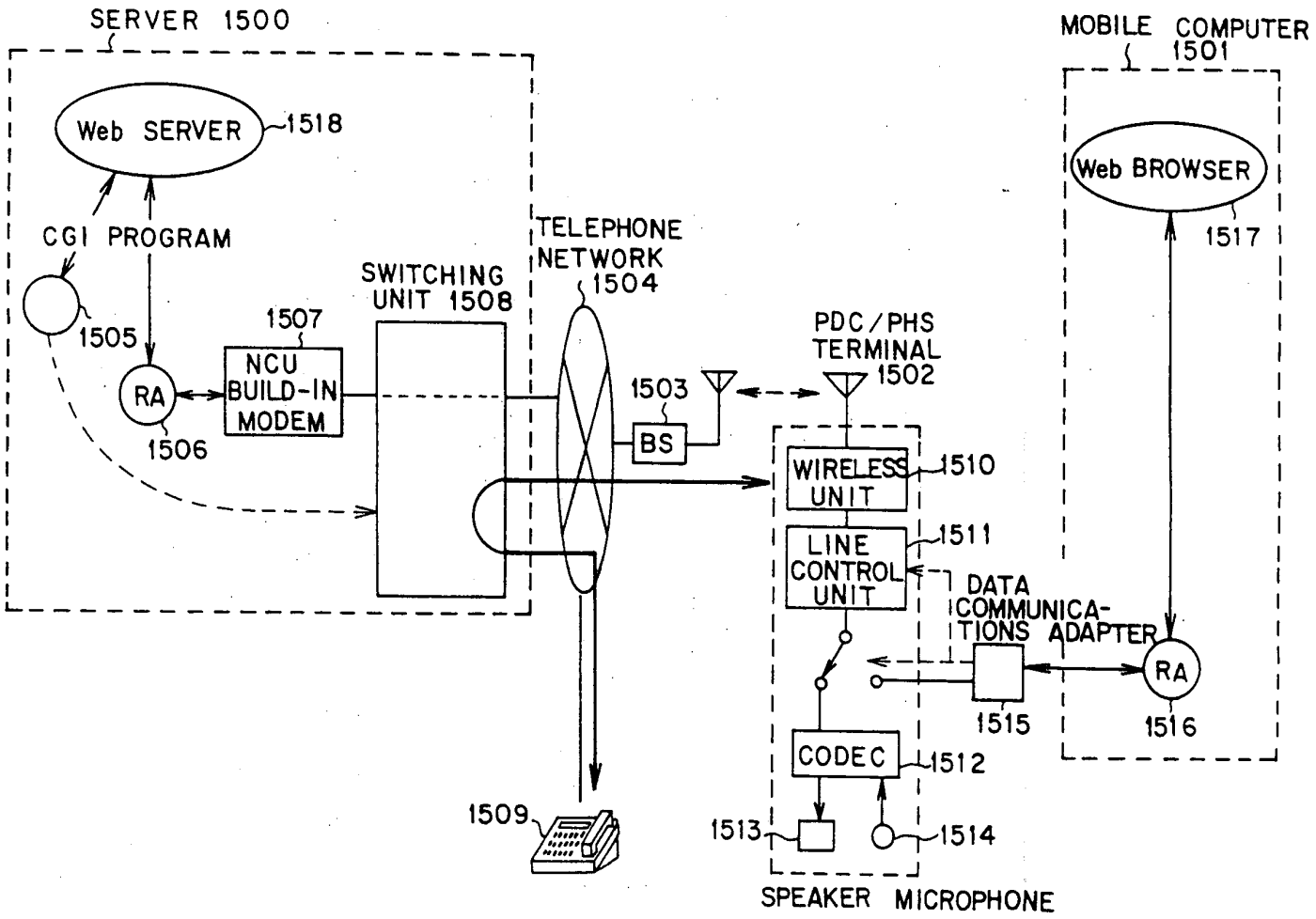


FIG. 16

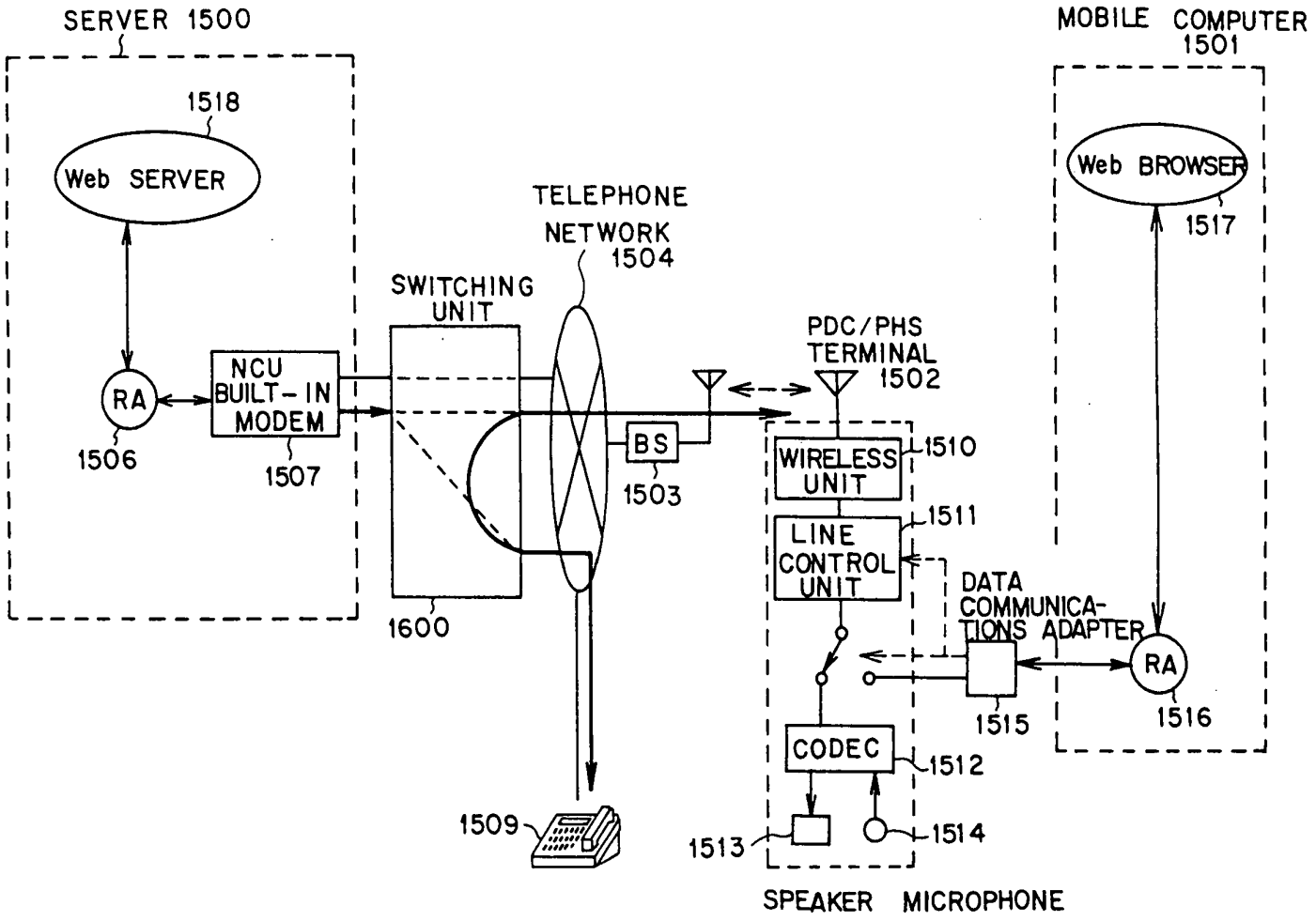

SERVER 1500
1518
Web SERVER
RA
1506
NCU
BUILT-IN
MODEM
1507
SWITCHING
UNIT
1600
TELEPHONE
NETWORK
1504
BS
1503
PDC/PHS
TERMINAL
1502
WIRELESS
UNIT
1510
LINE
CONTROL
UNIT
1511
CODEC
1512
1513
1514
SPEAKER
MICROPHONE
1509
MOBILE COMPUTER
1501
Web BROWSER
1517
DATA
COMMUNICA-
TIONS ADAPTER
1515
RA
1516

FIG. 17

EP 0 822 680 A2

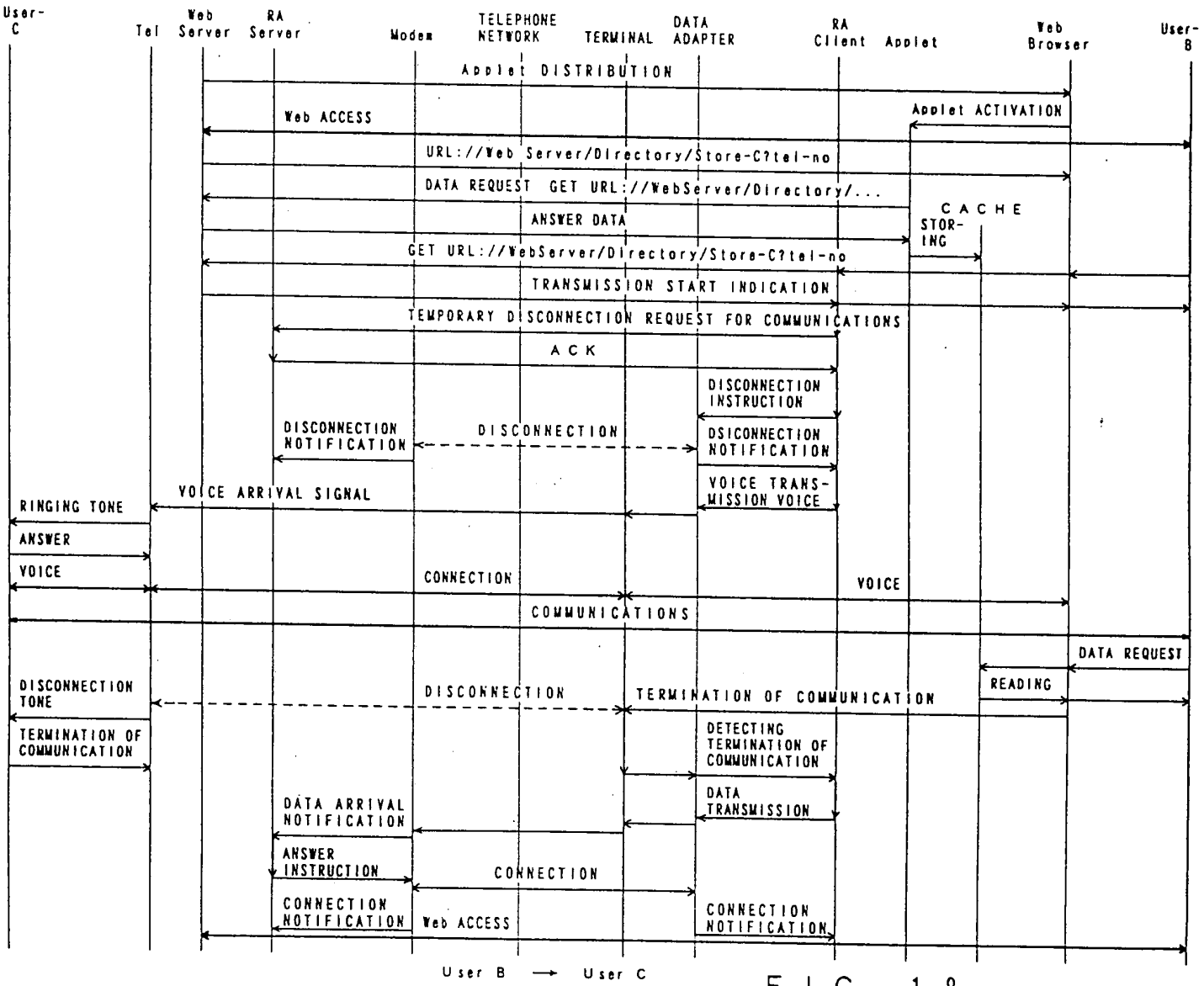


FIG. 18

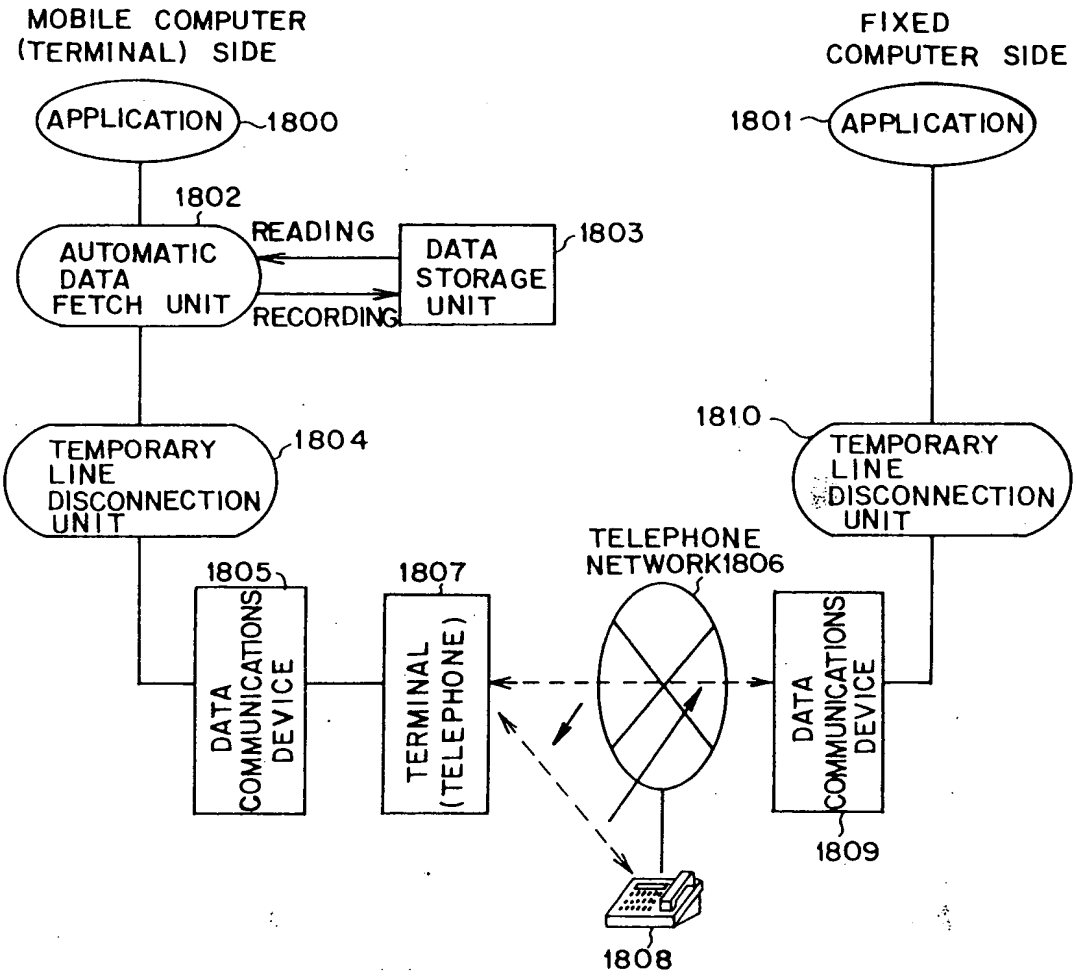

MOBILE COMPUTER
(TERMINAL) SIDE
FIXED
COMPUTER SIDE
APPLICATION
1800
1801
APPLICATION
1802
AUTOMATIC
DATA
FETCH UNIT
READING
RECORDING
DATA
STORAGE
UNIT
1803
TEMPORARY
LINE
DISCONNECTION
UNIT
1804
1810
TEMPORARY
LINE
DISCONNECTION
UNIT
TELEPHONE
NETWORK1806
1805
DATA
COMMUNICATIONS
DEVICE
1807
TERMINAL
(TELEPHONE)
DATA
COMMUNICATIONS
DEVICE
1809
1808

FIG. 19

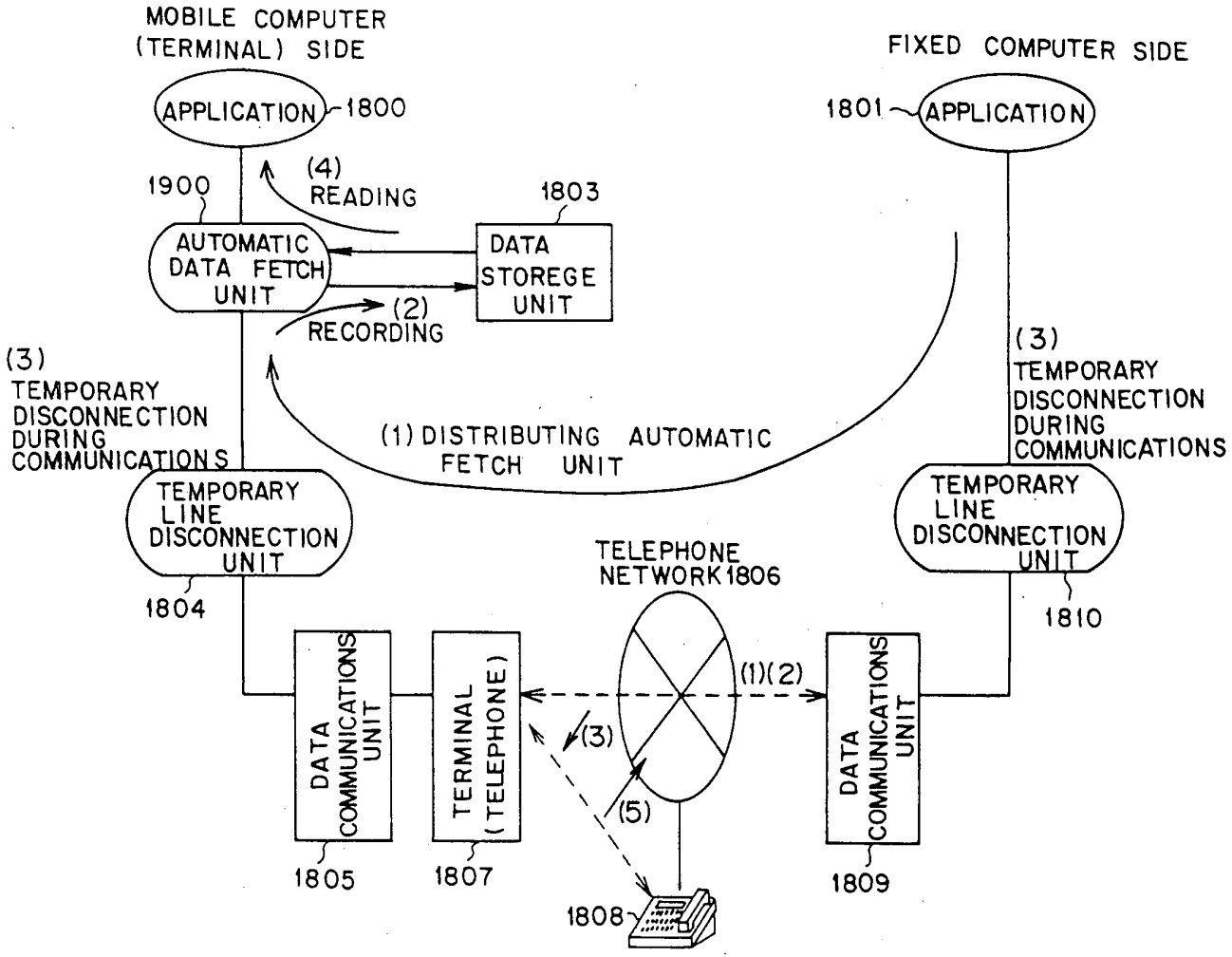

MOBILE COMPUTER
(TERMINAL) SIDE
FIXED COMPUTER SIDE
APPLICATION
1800
1801
APPLICATION
1900
(4)
READING
1803
AUTOMATIC
DATA FETCH
UNIT
DATA
STOREGE
UNIT
(2)
RECORDING
(3)
TEMPORARY
DISCONNECTION
DURING
COMMUNICATIONS
(1) DISTRIBUTING AUTOMATIC
FETCH UNIT
(3)
TEMPORARY
DISCONNECTION
DURING
COMMUNICATIONS
TEMPORARY
LINE
DISCONNECTION
UNIT
1804
TELEPHONE
NETWORK 1806
TEMPORARY
LINE
DISCONNECTION
UNIT
1810
DATA
COMMUNICATIONS
UNIT
TERMINAL
(TELEPHONE)
(1)(2)
(3)
(5)
DATA
COMMUNICATIONS
UNIT
1805
1807
1809
1808

FIG. 20

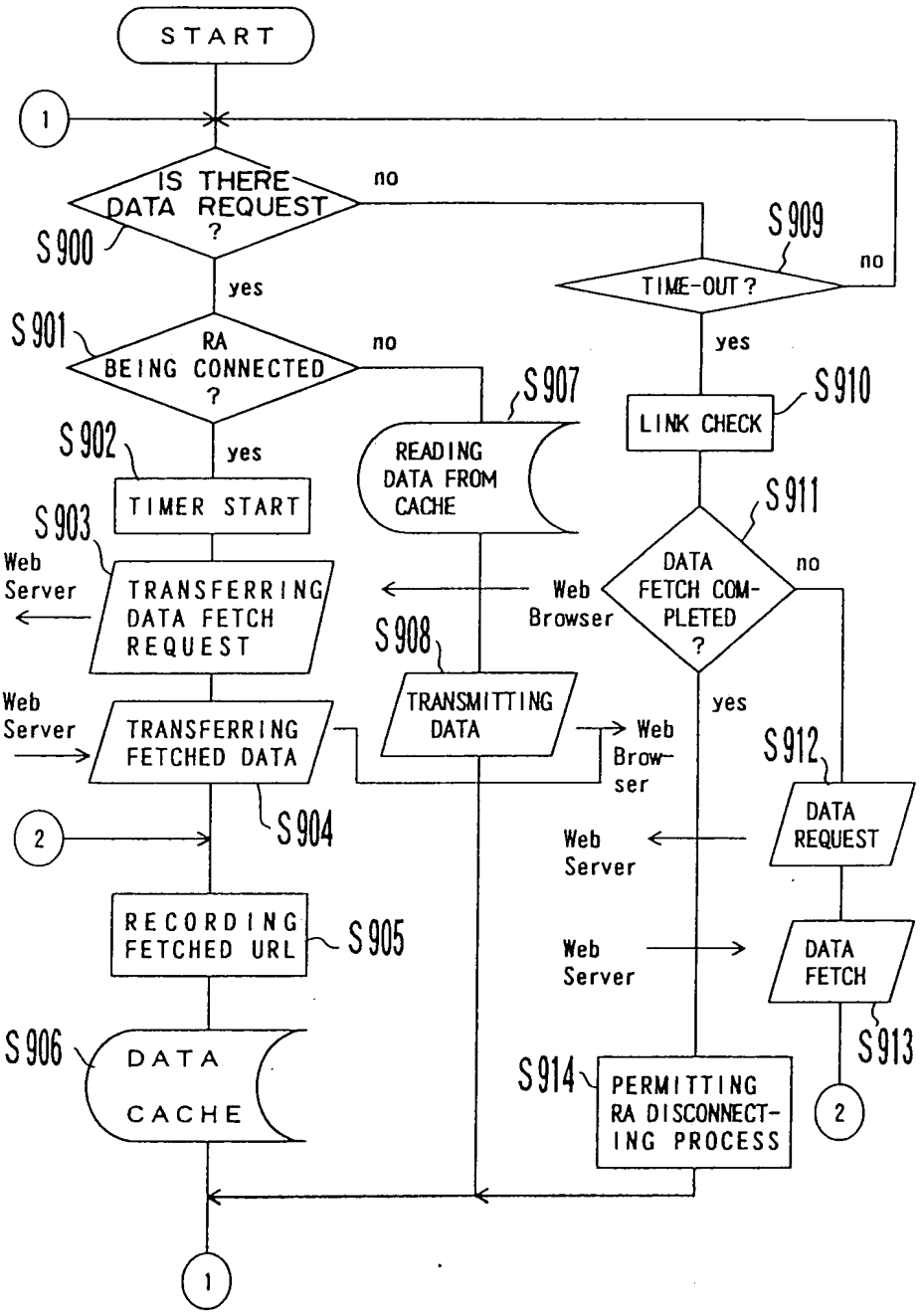

START
1
IS THERE DATA REQUEST ?
S900
no
yes
S909
TIME-OUT ?
no
yes
S901
RA BEING CONNECTED ?
no
yes
S907
READING DATA FROM CACHE
S910
LINK CHECK
S902
TIMER START
S911
S903
Web Server
TRANSFERRING DATA FETCH REQUEST
Web Browser
DATA FETCH COM-PLETED ?
no
S908
TRANSMITTING DATA
yes
Web Server
TRANSFERRING FETCHED DATA
Web Brow-ser
S912
DATA REQUEST
2
S904
Web Server
RECORDING FETCHED URL
S905
Web Server
DATA FETCH
S913
S906
DATA CACHE
S914
PERMITTING RA DISCONNECT-ING PROCESS
2
1

FIG. 21